

REMARKS

The rejections presented in the Office Action dated July 16, 2004 have been considered.

Claims 4 and 7 are amended to correct a typographical error (“instrumented” should have been “original”). Since the meaning of the claims could have been reasonably understood in view of the specification (and was by the Examiner), no amendment is thought to be necessary for purposes of patentability. However, the claims are amended for purposes of clarity.

The Office Action fails to establish that claims 1-14 are unpatentable under 35 U.S.C. §103(a) over Shaughnessy (U.S. 6,026,235) in view of Shaylor (U.S. 6,760,907). The rejection is respectfully traversed because the Office Action fails to show that all the limitations are suggested by the references, fails to provide a proper motivation for modifying the teachings of Shaughnessy with teachings of Shaylor, and fails to show that the combination could be made with a reasonable likelihood of success.

The Office Action does not establish that the Shuaghnessy-Shaylor combination teaches or suggests all the limitations of the claims. For example, the limitations of claim 1 include:

- generating instrumented versions of selected functions in relocation address space during program execution;

- when a function is called by an instrumented version of a selected function within the relocation address space resulting in a first return-pointer value in the relocation address space, identifying a location in the original address space corresponding to the first return-pointer value as an original return-pointer value, associating the first return-pointer value with the original return-pointer value, substituting references to the original return-pointer value for references to the first return-pointer value, and replacing an instruction at the address indicated by the original return-pointer value with a breakpoint; and

- when the breakpoint is encountered upon return of control at the original return-pointer value, obtaining the first return-pointer value associated with the original return-pointer value, and transferring control to an instruction at the address referenced by the first return-pointer value.

Shaughnessy does not appear to create instrumented versions of functions which are stored in relocation address space. Since Shaughnessy does not use relocation address space for instrumented versions of functions, Shaughnessy would not have to deal with a return-pointer to the relocation address space (e.g., an instrumented function calls another function and the called function must return control to relocation address space).

It appears that Shaughnessy has only one version of a function in an original address space, and Shaughnessy uses a stub table to redirect control to a monitoring tool. Thus, Shaughnessy has no call from an instrumented function in relocation address space to another function. Shaughnessy's function calls are made from functions in original address space. Furthermore, Shaughnessy has no apparent need to associate a return address in original address space ("original return-pointer value") with a return address in the relocation address space ("first return-pointer value"), as claimed, because Shaughnessy's approach appears to only deal with a single return address.

The Office Action acknowledges that Shaughnessy does not teach the limitations of, and associated with, replacing an instruction at the address indicated by the original return-pointer value with a breakpoint; and when the breakpoint is encountered upon return of control at the original return-pointer value, obtaining the first return-pointer value associated with the original return-pointer value, and transferring control to an instruction at the address referenced by the first return-pointer value. However, the Office Action alleges that Shaylor teaches these limitations. This allegation is mistaken.

Shaylor says nothing of breakpoints at the address indicated by a return-pointer value, as claimed. Shaylor's "first instruction of the inlined code is patched with a breakpoint instruction" (col. 9, ll. 3-4). The first instruction of inlined code does not suggest a breakpoint placed at the address referenced by a return-pointer value. Furthermore, the association of the original return-pointer value with the first return-pointer value is used to obtain the first return-pointer value, and control transferred thereto, when the breakpoint at the original return-pointer value is encountered. Thus, Shaylor does not suggest these limitations.

The alleged motivation for modifying Shaughnessy with Shaylor is improper because Shaughnessy teaches away from the proposed modifications using teachings of Shaylor, and no evidence is provided to support the combination. Shaughnessy describes a problem associated with using breakpoints for code patching, and claim 1 of the present invention includes limitations of and related to the use of breakpoints. Shaughnessy's only mention of breakpoints is in the Background in describing the perceived problem (col. 3, ll. 40-45). Shaughnessy does not appear to use breakpoints with his approach to monitoring compiled software. Thus, Shaughnessy teaches away from the use of breakpoints such as those taught by Shaylor.

The alleged motivation for modifying Shaughnessy with Shaylor is conclusory and improper. The alleged motivation states that “it would have been obvious ... to modify ... Shaughnessy ... using the teaching of Shaylor ... because one of ordinary skill in the art would be motivated to optimize execution of programs.” It is respectfully submitted that the Office Action does not provide any evidence, nor is it apparent, that Shaughnessy’s approach results in code that is less optimized than code resulting from a modification Shaughnessy. Furthermore, the Office Action provides no evidence to suggest those specific elements of Shaughnessy that could be modified with elements of Shaylor. Thus, the alleged motivation is improper.

The rejection of claims 1-14 over the Shaughnessy-Shaylor combination should be withdrawn because the Office Action fails to show all the limitations are suggested by the combination, fails to provide a proper motivation for combining the references, and fails to show that the combination could be made with a reasonable likelihood of success.

Claims 2-10 depend from claim 1 and further refine the limitations discussed above. Thus, the Office Action does not show that claims 2-10 are unpatentable over the Shaughnessy-Shaylor combination for at least the reasons set forth above. Those skilled in the art will recognize, as a general matter, that the claims include limitations of and related to return-pointer values. The cited teachings of Shaughnessy and Shaylor appear to be limited to entry points, and those skilled in the art will readily recognize that return-pointer values are different from entry points, and the cited teachings are not suggestive of the limitations of and related to return-pointer values.

Claims 11-13 include the limitations discussed above, and the Office Action does not establish that these claims are unpatentable for at least the reasons set forth above.


Claim 14 is an apparatus claim in means plus function format. The Office Action does not show that the Shaughnessy-Shaylor combination teaches the functions of the claim. Furthermore, the Office Action does not show that the Shaughnessy-Shaylor combination teaches any supporting structure. Therefore, claim 14 is not shown to be anticipated.

Withdrawal of the rejection and reconsideration of the claims are respectfully requested. If the examiner has any questions or concerns, a telephone call to the undersigned is welcome.

No extension of time is believed to be necessary for consideration of this response. However, if an extension of time is required, please consider this a petition for a sufficient number of months for consideration of this response. If there are any additional fees in connection with this response, please charge Deposit Account No. 50-0996 (HPCO.051PA).

Respectfully submitted,

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